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JUN 1 2 2020

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Serial No.	20-170
MPS Lic/DCB	R0
Docket No.	50-423
License No.	NPF-49

DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
LICENSEE EVENT REPORT 2020-003-00
REACTOR TRIP DUE TO TURBINE TRIP ON LOW CONDENSER VACUUM

This letter forwards Licensee Event Report (LER) 2020-003-00 documenting an event at Millstone Power Station Unit 3, on April 13, 2020. This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in manual or automatic actuation of systems listed in 10 CFR 50.73(a)(2)(iv)(B).

If you have any questions or require additional information, please contact Mr. Jeffry A. Langan at (860) 444-5544.

Sincerely,

John R. Daugherty
Site Vice President – Millstone

Attachments:
License Event Report 2020-003-00

Commitments made in this letter: None

IE22
NRR

cc: U.S. Nuclear Regulatory Commission
Region I
2100 Renaissance Blvd.
Suite 100
King of Prussia, PA 19406-2713

R.V. Guzman
NRC Senior Project Manager Millstone Units 2 and 3
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NRC Senior Resident Inspector
Millstone Power Station

ATTACHMENT

LICENSEE EVENT REPORT 2020-003-00
REACTOR TRIP DUE TO TURBINE TRIP ON LOW CONDENSER VACUUM

MILLSTONE POWER STATION UNIT 3
DOMINION ENERGY NUCLEAR CONNECTICUT, INC.

NRC FORM 366
(04-2020)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 04/30/2020

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Information Services Branch (T-6 A10M), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by e-mail to Infocollects.Resource@nrc.gov, and the OMB reviewer at: OMB Office of Information and Regulatory Affairs, (3150-0104), Attn: Desk Officer for the Nuclear Regulatory Commission, 725 17th Street NW, Washington, DC 20503; e-mail: oira_submission@omb.eop.gov. The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting or requiring the collection displays a currently valid OMB control number.

1. Facility Name	2. Docket Number	3. Page
Millstone Power Station Unit 3	05000423	1 OF 3

4. Title

REACTOR TRIP DUE TO TURBINE TRIP ON LOW CONDENSER VACUUM

5. Event Date			6. LER Number			7. Report Date			8. Other Facilities Involved	
Month	Day	Year	Year	Sequential Number	Rev No.	Month	Day	Year	Facility Name	Docket Number
04	13	2020	2020-003-00			06	12	2020		05000
									Facility Name	Docket Number 05000

9. Operating Mode	11. This Report is Submitted Pursuant to the Requirements of 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. Power Level	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
082	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ Other (Specify in Abstract below or in NRC Form 366A)	

12. Licensee Contact for this LER

Licensee Contact	Telephone Number (Include Area Code)
Jeffry A. Langan, Manager Nuclear Station Licensing	860.444.5544

13. Complete One Line for each Component Failure Described in this Report

Cause	System	Component	Manufacturer	Reportable to ICES	Cause	System	Component	Manufacturer	Reportable to ICES

14. Supplemental Report Expected	15. Expected Submission Date	Month	Day	Year
☐ Yes (If yes, complete 15. Expected Submission Date) ☒ No				

Abstract (Limit to 1400 spaces, i.e., approximately 14 single-spaced typewritten lines)

At 15:50 on 4/13/2020, with Millstone Power Station Unit 3 (MPS3) operating at approximately 82% reactor power, an automatic reactor trip occurred following a turbine trip due to low condenser vacuum. Severe environmental conditions resulted in significant debris impingement on the travelling screens, and clogging of the screenwash system strainers, leading to both screenwash pumps tripping, high travelling screen level differential and the trip of two circulating water pumps. The loss of two circulating water pumps resulted in a rapidly degrading condenser vacuum and a turbine trip on low condenser vacuum. The Auxillary Feedwater System actuated as designed following the trip.

The low condenser vacuum trip was caused by rapidly degrading environmental conditions that overcame the capacity of the screen wash system leading to a trip of both screen wash pumps and two circulating water pumps.

The screen wash system strainers were cleaned, and the screen wash system and travelling screens were returned to service. All circulating water pumps were restored, and condenser vacuum reestablished at 14:10 on 4/14/2020.

The actuation of the Reactor Protection System (RPS) and the Auxiliary Feedwater System (AFW) is being reported in accordance with 10CFR50.73(a)(2)(iv)(A) as an event that resulted in a manual or automatic actuation of systems listed in 10CFR50.73(a)(2)(iv)(B).

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Millstone Power Station Unit 3	05000423	2020	- 003	- 00

NARRATIVE

1. EVENT DESCRIPTION

At 15:50 on 4/13/2020, with Millstone Power Station Unit 3 (MPS3) operating in Mode 1 at approximately 82% reactor power, an automatic reactor trip occurred following a turbine trip due to low condenser vacuum caused by the trip of multiple circulating water pumps.

At approximately 12:42 in anticipation of increasing wind speed and degrading intake conditions, the plant completed a downpower to approximately 82% power to facilitate condenser backwashing. Throughout the afternoon, severe winds blew a significant amount of seaweed into the MPS3 Intake structure and onto the intake travelling screens, with carry-over fouling screenwash strainer baskets and condenser Inlet water boxes. The intake conditions were being managed by the operations crew with condenser vacuum at approximately 2.8 inhg. Over a period of approximately 4 minutes conditions rapidly degraded. At 15:44 the 'B' screen wash pump tripped on high-high strainer differential pressure, followed 38 seconds later by a trip of the 'A' screen wash pump on high-high strainer differential pressure. The loss of screenwash spray to the travelling screens resulted in increasing level differential across the travelling screens. At 15:48, the 'B' circulating water pump tripped on high screen differential level, followed 55 seconds later by a trip of the 'E' circulating water pump. The loss of two circulating water pumps resulted in rapidly degrading condenser vacuum, followed by a turbine trip on low vacuum, and an automatic reactor trip due to the turbine trip.

All control rods inserted on the reactor trip. Main feedwater was isolated as designed following the trip, and auxiliary feedwater actuated automatically. The operating crew shifted decay heat removal from the condenser to the atmospheric steam dumps due to decreasing reactor coolant system (RCS) temperature and in anticipation of complete removal of all circulating water pumps due to no screen wash pumps running. All other systems responded as expected to the trip.

The actuation of the Reactor Protection System (RPS) and the Auxiliary Feedwater System (AFW) is being reported in accordance with 10CFR50.73(a)(2)(iv)(A) as an event that resulted in a manual or automatic actuation of systems listed in 10CFR50.73(a)(2)(iv)(B).

2. CAUSE

The direct cause of the reactor trip was a turbine trip due to low condenser vacuum. The low condenser vacuum trip was caused by rapidly degrading environmental conditions that overcame the capacity of the screen wash system leading to a trip of both screen wash pumps and two circulating water pumps.

LICENSEE EVENT REPORT (LER) CONTINUATION SHEET

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. LER NUMBER		
		YEAR	SEQUENTIAL NUMBER	REV NO.
Millstone Power Station Unit 3	05000423	2020	- 003	- 00

NARRATIVE

3. ASSESSMENT OF SAFETY CONSEQUENCES

The plant response to this trip was bounded by the FSAR chapter 15.2.5 Loss of Condenser Vacuum safety analysis. The safety analysis event does not credit the reactor trip on turbine trip but rather credits the safety grade high pressurizer pressure trip. The plant was operating at 82% rated thermal power (RTP) rather than the 102% RTP assumed in the safety analysis. Additionally, not credited in the safety analysis, the steam generator atmospheric relief valves were available for steam relief. The loss of condenser vacuum experienced was less adverse than the event as described in the FSAR. The review of the trip concluded that no safety functions were challenged, and plant operation was maintained well within the bounds of the FSAR Chapter 15 Safety Analysis. All systems required to shut down the reactor and maintain safe shutdown, remove residual heat, control the release of radioactive material or mitigate the consequences of an accident were available.

4. CORRECTIVE ACTION

The screen wash system strainers were cleaned, and the screen wash system was returned to service, allowing debris to be removed from the travelling screens, and differential level to be restored to normal. All circulating water pumps were restored, and condenser vacuum reestablished at 14:10 on 4/14/2020.

Additional corrective actions to improve the screen wash and circulating water system's operation under severe environmental conditions are being evaluated in accordance with the station's corrective action program.

5. PREVIOUS OCCURENCES

No similar plant trips due to excessive biofouling of the intake structure systems over the past 4 years.

6. Energy Industry Identification System (EIIS) Codes

Circulating water pumps KE, P
Screen wash pumps MD, P
Screen wash strainer MD, STR
Main condenser SG, COND